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DISBUDDING OF CALVES AND DISHORNING OF ADULT CATTLE

[ISSUED BY THE TECHNICAL DEVELOPMENT COMMITTEE OF THE B.V.A.]

Disbudding of Calves

Methods of disbudding usually practised are those involving the use of caustics or of actual cautery to destroy the horn-secreting tissue.

USE OF CAUSTICS

It is recommended that disbudding by use of caustics be carried out within 10 days of birth.

Preparation of the Site

Clip the hair around the horn bud and cleanse the surface with a de-fatting agent such as ether, petrol or spirit. Thorough cleansing to remove the surface fat is essential to the success of the method. Allow to dry before proceeding with the application of the caustic agent.

Caustic Potash Sticks

After preparing the site, make a ring with vaseline around the outer edge of the horn bud to prevent the surface spread of the caustic. Apply caustic to the horn bud by rubbing until small beads of blood appear over the surface of application. Where the horn buds are prominent, it is advantageous to scrape off with a scalpel prior to application of the caustic.

Care must be taken to avoid excess of caustic running down the side of the face and causing an unnecessary burn.

The calf should be separated from its dam for three to four hours after application of the caustic and kept in the dry for 24 hours. It should be re-examined in 48 to 72 hours to ensure that a good escar is present.

The user must be protected from the caustic and where a holder or thick rubber glove is not available a short piece of milking machine rubber tubing or some stout brown paper folded several times can be adapted for use.

The method has obvious disadvantages, including that of being associated with considerable pain in individual calves. It has been superseded generally by the other methods described.

Disbudding Fluids—Caustic Collodion

The preparation in common use is antimony trichloride 28 per cent. W/V with salicylic acid in collodion. After preparation of the site, as described previously, a little of the disbudding collodion is rubbed into the bud, using a small brush, and allowed to dry. A second application is then made, simply painting on the caustic collodion, so that a firm "skin" adheres to the whole area of the horn bud. It is advisable to shake the bottle before each application.

It is recommended that the calf be inspected in 48 to 72 hours to ensure that the collodion is still adhering firmly. If not, a second application is necessary. The application of the caustic should be confined to the horn bud.

The method is not suitable for calves over 10 days old.

Care must be taken to ensure that the collodion does not come into contact with the surrounding skin of the calf or with the skin of the user. In such an event it should be removed immediately, using the cleansing fluid.

Use of the Actual Cautery

It is recommended that this method be used within 10 days of birth although successful disbudding can be accomplished by cautery up to three or four weeks of age. A local anaesthetic should be given in calves of all ages; in addition to rendering the application of the iron painless, it facilitates efficient use.

Where horn buds are prominent more drastic cautery is required, particularly in older calves, and experience is essential if uniformly successful results are to be achieved.

Electric thermostatically controlled instruments are available, but some models do not stand up to the stress of farm use. Various disbudding irons—cup-shaped to cover the horn bud—which can be heated in the ordinary fire are on the market. Their efficiency varies with the temperature to which they are heated, and the experience of the user. A fairly substantial iron which will hold the temperature to which it is heated for a sufficient length of time to permit effective disbudding is preferable. The cup-shaped end of the iron is applied over the horn bud for two periods of five seconds or one period of 10 seconds or longer if necessary. If the depth of the ring burnt into the skin around the bud appears to the user to be adequate, the iron is then turned on to its side and the tissue within the ring burnt down to that level. In the case of calves with prominent horn buds, the removal of the bud with a scalpel prior to application of the iron or gouging it out with the iron during the process of disbudding expedites the cautery.

Anaesthesia can be achieved by injecting 1 to 2 c.c. of a 2 per cent. novocain solution below the lateral ridge of the frontal bone at a point midway between the horn bud and the eye. As an alternative, the horn bud can be infiltrated with the local anaesthetic.

Inexpert application, particularly in older calves, with any of the methods described can cause the animal considerable pain and distress.

DISBUDDING OF KIDS

The technique is the same as that described for calves.

The use of the caustic stick is not infrequently associated with the manifestation of pain for a considerable period after application.

Dishorning of Adult Cattle

The Technical Development Committee have enquired into the methods of dishorning cattle and passed the following resolution on July 13th, 1951 :—

"This Committee, having collected a considerable volume of evidence on various methods of dishorning

cattle, expresses disapproval of the method of dishorning involving the use of a ligature whether or not an anaesthetic is given at the time of application, on both humane grounds and lack of efficiency."

"In further discussions, reported to Council, the Technical Development Committee recommended that dishorning must be carried out under an efficient anaesthetic, the choice of which must remain within the discretion of the veterinary surgeon concerned."

Ideally, dishorning should aim at producing a natural polled effect, obviating any regeneration resulting in stunted horn growth. To obtain this effect it is necessary to amputate with the horn the corium at its base, for which purpose about a one-quarter inch margin of the epidermis must be removed.

Arrangements should be made with the farmer to ensure that suitable facilities and adequate help are available to permit skilled and expeditious handling of the stock to be dishorned.

It is not advisable to perform the operation during the fly season, owing to the risk of operation wounds and sinuses becoming parasitised by biting flies or maggots. Experience also shows that exposure of milking stock to undue cold—and, more particularly, to cold windy weather—immediately after dishorning is often followed by malaise and consequent loss of milk. In individual animals, where the sinuses are particularly patent following removal of the horns and prior to healing, driving rain may accumulate in the sinuses causing sinusitis. Relief may be given by tilting the head to drain the sinuses and by irrigation with a non-irritant antiseptic at blood heat.

It is often recommended that cattle which are too old for disbudding methods should not be done until they are about 18 months old and horn growth is well established, because of the difficulty often experienced in ensuring there is no regeneration of horn subsequently. The removal of an adequate margin of epidermis at the base of the horn may obviate this possibility where early removal is desired.

Anaesthesia

The choice of anaesthesia (general or local) must remain within the discretion of the veterinary surgeon responsible and will be dictated by the circumstances obtaining, with particular reference to the facilities and assistance available, and the breed and type of cattle to be dishorned.

General Anaesthesia

The farmer should be advised of the need for an adequate period of starvation prior to administration of a general anaesthetic. Methods in common use are :—

(*a*) Administration of chloroform with the animal in a standing position, by the use of a Cox's mask or some adaptation of this type of mask. A dose of 3 to 4 oz., depending upon the breed, is usually recommended.

(*b*) Administration of chloroform, after casting, using a similar type of mask.

(*c*) Administration of chloral hydrate intravenously. In individual difficult animals, particularly adult bulls, chloral hydrate can be given intravenously as an anaesthetic, or as a narcotic to be followed by chloroform or cornual nerve block.

Regional Anaesthesia by Cornual Nerve Block

Dishorning by cornual nerve block is the method more commonly practised. It enables the operation to be carried out in a dairy herd with the animals in their usual places secured by a chain or yoke, particularly in those cowsheds in which there is a feeding passage permitting movement of the operator in front of the cow. Rope halters are put on to facilitate handling the head.

As an alternative, the animals can be secured by good rope halters to a strong permanent fixture, preferably in a yard or other enclosed part of the premises. Where such facilities do not exist, a stout horizontal bar, erected for the purpose at a height of 3 ft. to 3 ft. 6 in. from the ground, can be used, with room in front for the operator to work.

Technique.—Locate the lateral ridge of the frontal bone which will be found as a sharp border extending from the orbit to the root of the horn (the long axis of the head is assumed to be vertical). The cornual nerve, which supplies the horn core and neighbouring skin, ascends from the orbit to the horn immediately behind this ridge, accompanied by a small artery and vein. This nerve becomes more superficial as it ascends until it is almost subcutaneous, being covered only by skin and a very thin layer of the panniculus muscle for the last inch or more of its course below the horn. It there rests on a thin aponeurosis which overlies the temporal muscle. This is the best site for injection, which should be made subcutaneously and dispersed by digital pressure, care being exercised that the point of the needle does not pierce the aponeurosis over the temporal muscle, in which event the anaesthetic would be injected into this muscle and have little or no effect on the nerve. In the case of animals with very thick horns and, in particular, bulls, it is advisable to give a second smaller injection behind the main site in order to include any branches of the nerve which may be given off below this site to the posterior portion of the base of the horn.

Some operators select a lower site than the above for the injection, viz., a point about midway between the base of the horn and the lateral canthus of the eyelids, close behind the lateral ridge of the frontal bone. At this position, however, the nerve is much more deeply placed than at the higher site and is embedded in fat, so that it is more difficult "to strike" the location accurately with the point of the needle making the injection.

A 5 per cent. procaine solution is suitable. The addition of one of the hyaluronidase preparations obtainable, adding one vial or 3 mg. to 100 c.c. of anaesthetic, has proved of great value in ensuring dispersion and efficient anaesthesia. An injection of 5 c.c. is given over each nerve, but larger quantities may be used in individual animals should it be deemed necessary by the operator. Anaesthesia becomes effective in about 15 to 20 minutes and will continue for about one hour after injection. It is usual to administer the anaesthetic to a batch of 12 or more animals if available, by which time the first animal injected is ready for dishorning. It is essential to give adequate time for full anaesthesia to develop.

Preparation Immediately before Dishorning

Prior to dishorning, the hair is clipped from the base of the horn and a strong tourniquet of binder twine is applied below the base of the two horns with cross pieces.

The site is cleansed with spirit and the completeness of anaesthesia tested by pricking the epidermis round the base of the horn with a needle, especially at its highest point, approaching the animal from behind so that it does not anticipate the test. If anaesthesia is inadequate, the injection should be repeated, taking care to disperse it more widely, or general anaesthesia may be administered, at the discretion of the veterinary surgeon.

Amputation of the Horns

A saw is used and an ordinary butcher's saw, with detachable blade permitting easy replacement, is probably the most efficient and rapid in action.

A hack saw, tenon saw or wire saw can be used, but the degree of physical fatigue involved in the use of the wire saw is much greater. Information on the use of shears is limited, but some veterinary surgeons have found them satisfactory, though fractures of the frontal bone have occurred with this method.

When using cornual nerve block and a butcher's saw, it is usual to cut from above downwards and outwards including a one-quarter inch margin of the epidermis at the base of the horn, with the animal in a recumbent position. When using a wire saw, the opposite direction for removal is preferable. Removal can be completed with the saw or, when the lower skin margin above the ear is reached, the sawn-off horn can be depressed and the cornual artery picked up with artery forceps and twisted or ligated to control haemorrhage ; scissors or a scalpel are then used to sever the skin. It is not usual to apply dressings, the sinus being patent and any sealing tending to contribute to the possibility of sinusitis.

Haemorrhage is not often troublesome and, even without any attempt at its control, it usually ceases spontaneously in a short time. Obviously, it is preferable to control it and, where reliance is being placed upon a tourniquet for this purpose, this must be renewed should it be cut through during the process of dishorning. A hot iron can be used where it is impossible to apply a tourniquet.

After-treatment

Dishorned animals are better turned out to grass immediately : they should be re-inspected in a few hours. It is not advisable to keep them housed or in yards for the first two or three hours after operation. As sensation returns, pain or itchiness causes animals to rub their polls against fixed objects which may increase haemorrhage or result in damage or infection.

Any animals in which haemorrhage persists should be given the necessary attention, controlling it either by more efficient application of the tourniquet, by ligation of the artery concerned or, if that fails, by the application of a temporary compress of sterile gauze and cotton wool for a sufficient period to effect control.

The tourniquet is removed in 12 to 18 hours. If attempts are made to clean up any blood clots around the operation area, care must be taken not to allow the ingress of water or other material to the sinuses.

Sheltered pastures are preferable for at least 24 hours after the operation. The dishorned stock should be carefully supervised and any malaise noted, since it may be associated with sinusitis ; this usually responds rapidly to early treatment by irrigation of the sinuses, using a non-irritant antiseptic at blood heat or normal saline followed by the application of an antibiotic. In those cases associated with high temperature, penicillin intramuscularly or sulphamezathine given intravenously or subcutaneously, and used topically, is useful. Aspirin in medicinal doses can be given to relieve pain.

In those cases of sinusitis in which the frontal sinus is not patent or in which the aperture is small, it is necessary to provide an opening through the base of the horn core and to drain the sinus by irrigation. Subsequently, daily irrigation is necessary until recovery ensues. In a very few cases clinical sinusitis may not occur for some weeks or months after the operation. In such cases, the pus may have become inspissated and trephining may be necessary to provide adequate drainage. The extent of the frontal sinus is very limited in the cow, the operation areas being very limited in consequence.

Sinusitis varies greatly in its intensity and in severe cases may simulate the symptoms associated with tetanus, including trismus.

A high temperature is usually present, the animal is very depressed, and stands with its head extended and lowered, giving the impression of having a marked " headache." The neck is held stiffly and the animal appears to move in one piece without bending the neck. Tremors and stiffness may be present in severe cases.

Where the operation site becomes flyblown, it is necessary to give protection from flies by housing, and after the removal of the maggots and irrigation of the sinuses, a light protective gauze dressing can be applied and renewed daily after irrigation.

Chloroform anaesthesia must of necessity involve the risk of delayed chloroform poisoning in individual animals. Close supervision therefore should be maintained during and for a day or two subsequent to anaesthesia.

Dishorning is not usually associated with any marked drop in milk yield, after the first 24 hours. Loss of milk is more likely to occur in high-producing animals and particularly where a general anaesthetic is used and there has been pre-operative starvation. Even in these cases recovery to full yield is usually effected within a few days.

DISHORNING OF ADULT GOATS

This technique follows the same general principles as those described for cattle. The differing conformation of the head and frontal sinuses, and the position of the horns, result in the operation wounds being at the highest point. Sinusitis, should it occur, is likely to be more difficult to relieve.

The removal of the horns usually results in widely patent sinuses which may take considerable time to heal over in some cases.

NEW SLAUGHTERHOUSES TO AWAIT IMPROVEMENT IN ECONOMIC SITUATION

In its issue of March 13th the *Meat Trades Journal* reports that Northallerton, the North Riding town whose Urban Council has been campaigning for three years for the provision of a new public slaughterhouse in the town, needed because the existing premises are "inadequate and unhygienic," have heard from the Minister of Agriculture, Sir Thomas Dugdale, who is the local M.P., that Northallerton's needs would be kept in mind and the proposal for the slaughterhouse examined as soon as the Minister of Food could consider the whole position.

"Sir Thomas points out that the previous Government had decided on the policy of moderate concentration of slaughterhouses, which would require national siting after full consultation with the various bodies concerned. The new Government had yet to decide if those arrangements would stand, but apart from that, the economic situation prevented them from letting any local authority erect a slaughterhouse. 'We do realise the shortcomings of slaughterhouses at Northallerton,' says Sir Thomas's reply, 'but I am afraid that until it is possible to improve the system generally we must continue to use some premises in various parts of the country which are not entirely suitable.'"

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LIGHT HORSE STALLION SHOW

The Hunters Improvement and Light Horse Breeding Society held its annual show of stallions on Derby racecourse last week. It attracted an entry of 77, including 17 in the recently introduced class for stallions never previously shown. The chief business of the day was the allocation of the season's premiums. Of these there are 46 in England and Wales and two in Scotland, each worth £325; in addition there are 12 super premiums of £150 and two championship awards of £50. Successful stallions are allocated to the various districts where they will be available to serve half-bred mares at the low fee of £3.

LIVESTOCK AND THEIR ENVIRONMENTS: SUNLIGHT AND VITAMIN D

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PART II

Summary

In a search for criteria of avitaminosis D in the field, some of the physiological properties of the vitamin are critically reviewed. Frank rickets and disturbances of the serum calcium and phosphate levels are considered to be less useful indicators than growth rates or the efficiencies of food utilisation.

Since few British figures for the vitamin D content of grass, silage and hay are available, data from many sources have been considered in an attempt to discover how vitamin D content may be correlated with methods of crop production. It is contended that climatic conditions in Britain, coupled with modern methods of hay-making and the stress which recently has been laid upon the preservation of high protein and carotene contents in hay, are very liable to produce hay of low vitamin D potency. Grass and silage are certainly still less potent.

It has been calculated that direct sunshine in Britain cannot contribute more than an average of 3,000 to 4,500 I.U. of vitamin D per day to a beast of 1,000 lb. weight. Probable limits, which still may need to be diminished, are given.

(3) The Influence of Vitamin D on Mammalian Metabolism

Unlike vitamin A and some members of the vitamin B-complex which occur in the animal body in compounds of known chemical structures and physiological functions, the point of entry of vitamin D into mammalian and avian metabolism is unknown.* Nevertheless, any criterion of vitamin D deficiency in livestock must be based on existing knowledge of the characteristics of the vitamin.

A relationship is known to exist between the vitamin D intake of mammals and birds and (*a*) mineral absorption from the intestine, (*b*) calcium, phosphorus and phosphatase levels of the blood, (*c*) bone formation, (*d*) growth rate, (*e*) reproduction and (*f*) efficiency of food utilisation.

(*a*) *Mineral absorption.*

Nicolaysen (1937) seems to have been the first worker to show directly that vitamin D increases calcium absorption from the intestine; later work with radio-calcium (Greenberg, 1945) has confirmed this. Although this work was carried out with rats, the effect is one which seems to be common to all species.

Calcium, of course, does not occur in elemental form either in natural feeding-stuffs or in mineral supplements. Apart from physical factors, such as the fineness of grinding of mineral mixes, the efficiency of absorption of calcium from the intestine depends upon its state of chemical combination. As sulphate (Glanzmann, Meier & Uehlinger, 1946), as rock phosphate (Shrewsbury & Vestal, 1945) or as fluoride, it is poorly absorbed. From the point of view of natural foods, the most important element influencing the absorption of calcium is phosphorus. This again may be present in such forms as (i) inorganic phosphates, (ii) organically combined phosphorus and, although this is a special case of the latter, (iii) phytate phosphorus. The chemical forms in which the original calcium and phosphorus of a diet are present when the ingesta reach the small intestine depend in part upon the species of animal concerned. Mellanby (1949) has stressed the adverse effects which phytate has upon calcium and phosphorus absorption in the dog; on the other hand, phytate may be broken down completely in the sheep, presumably by microbial action (Reid, Franklin & Hallsworth, 1947), whilst there is evidence that even in animals with simple digestive tracts some adaptation may occur (Walker, Fox & Irving, 1948).

It has been necessary to emphasise the different forms in which calcium and phosphorus may occur in foods, and their influence upon mineral absorption, because so many experiments have been made in which relationships have been sought between vitamin D and the *total* calcium and phosphorus of the ration.

With this very important reservation in mind, it can be said that the administration of vitamin D leads directly to increased net calcium absorption and, as a secondary effect, to greater net absorption of phosphorus. The fact that *net* absorption alone can be discussed at this stage also needs to be stressed. Despite experiments which have been carried out in an attempt to elucidate the mechanism of the excretion of mineral elements into the intestine, far too little is yet known for general application. Clearly, however, the net absorption of a given element involves (i) the amount ingested, (ii) the amount absorbed from the intestine and (iii) the quantity excreted into the intestine, doubtless at some part of it different from the site of absorption mentioned under (ii). As examples of the power of vitamin D to influence calcium and phosphorus absorption, the results of Wallis, Palmer and Gullickson (1935) may be cited. Calves which were given vitamin D increased their retentions of the two elements tenfold, as compared with their balances on vitamin D-free diets. Similar increases were reported by Wallis (1938a) for mature cows in milk. In those two cases the ratio of retained calcium to that of phosphorus was approximately 2 : 1; that same ratio has been found in experiments with species other than cattle.

(*b*) *Calcium, phosphorus and phosphatase levels of the blood.*

Whereas very low dietary levels of calcium and phosphorus lead ultimately to diminished concentrations of the calcium and inorganic phosphate ions of the blood, the administration of vitamin D tends to restore normal levels. Although these phenomena have been much studied, there is no need here to deal with them at length because with cattle, sheep and pigs (Bethke, Edginton & Kirk, 1933) more delicate indicators of avitaminosis D exist than blood levels of calcium and phosphorus.

(*c*) *Bone formation.*

Mellanby (1919) was the first to show clearly the favourable effects of a fat-soluble vitamin upon bone development in young animals. Since that time very many researches have been carried out on the inter-relationships of calcium, phosphorus and vitamin D in bone growth in many different species of animal. It is possible to cite only field results which seem to be of importance, ignoring purely histological studies and controversies with respect to the details of the mechanisms by which calcium and phosphorus are laid down in bone.

The conclusions which may be drawn are as follows. Firstly, the incidence of rickets in the young of any species is likely to increase as the absolute amounts of calcium and phosphorus in the diet are diminished. This was well shown for the rat by Brown and collaborators (1932), and for the pig by Bethke *et al.* (*op. cit.*), to quote but two of the many studies.

Secondly, bone malformation is the more probable as the dietary calcium-phosphorus ratio deviates from about 1·5 : 1. This has been shown to be true for the rat (Brown *et al.*, *op. cit.*), silver fox (Ott & Coombes, 1941), pig (Aubel & Hughes, 1937), horse (Groenewald, 1937) and cattle (Marek, Wellman & Urbanyi, 1938). There is thus little doubt as to

* See, however, the recent work by R. Zetterström (*Acta. chem. Scandinav*, 1951, **5**, 343) on the enzymic properties of vitamin D-phosphatase.

the wide applicability of the effect. Moreover, it follows from what has been said in the two preceding paragraphs that the worst possible conditions for bone formation exist when either calcium or phosphorus is present in small amount in the diet while the other element is there in abundance.

Thirdly, the presence of vitamin D in the ration generally improves calcium and phosphorus assimilation and tends to offset the effects of mineral imbalance. This has been demonstrated with the dog (Morgan, Garrison & Hills, 1933), pig (Johnson & Palmer, 1939; Senior, 1941) and calf (Bechdel, Hilston, Guerrant & Dutcher, 1938).

Fourthly, there seem to be well marked species differences between the amounts of vitamin D required for the prevention of rickets. Provided that there are at least minimum intakes of calcium and phosphorus and the Ca/P ratio is about 1·5 : 1 the albino rat requires but little vitamin D for bone formation. Man himself, and the young dog, cow or horse all need the vitamin, no matter how well balanced the mineral fraction of the diet. In some species, and even in certain breeds, very large amounts of vitamin D may be necessary to control what seem to be only slight imbalances of calcium to phosphorus. On the vitamin D derived from sunlight and an intake of 1 gallon of milk per day, no differences were observed between calves receiving diets with Ca/P ratios of 1·2 and 3·3 respectively (du Toit, Malan & Groenewald, 1933). On the other hand, Great Danes, as well as some of the other larger sized breeds of dog, are sensitive to slight deviations from a Ca/P ratio of about 1·3 : 1 (Morgan, 1940).

(*d*) *Growth rates.*

Although the growth rates of young animals depend in part upon skeletal development, the practical question arises of whether vitamin D has also a direct stimulus for growth. Evidence upon this point has been obtained with the pig by Bethke *et al.* (*op. cit.*), who found that the addition of vitamin D to a pig ration containing 0·45 per cent. of phosphorus and having a Ca/P ratio of 2 : 1 gave rise to better weight gains than were observed with untreated animals, despite the fact that there were no real differences between the serum calcium and phosphorus levels and the bone-ash percentages recorded for the two groups of animals. Ewer and Bartrum (1948), using sheep, also obtained results which suggest that growth rate is a much more delicate indicator of avitaminosis D than clinical rickets.

(*e*) *Reproduction.*

Since vitamin D affects the serum levels of calcium and phosphorus, one might logically expect that all of the tissues served by the blood would suffer during avitaminosis D.

Considering first the laboratory rat, it was shown by Opper and Thale (1943) that after six weeks on a deficient, maize diet, these animals exhibited continuous di-oestrum, normal cycles being restored by the administration of vitamin D or by ultra-violet irradiation of the animals. In the case of the larger, domesticated creatures Wallis (1938) reported disturbances of the sexual cycles of the cow as the result of lack of vitamin D, although the ration used contained adequate amounts, in good ratio, of calcium and phosphorus. The reality of the effect is thus beyond doubt; whether one elects to describe it as a direct or indirect one is scarcely significant.

(*f*) *Efficiency of food utilisation.*

Loss of appetite is one of the accompaniments of avitaminosis in young animals. The careful experiments of Bethke and his collaborators, already cited, showed that the addition of 0·5 per cent. of cod-liver oil to the diet of young pigs led to 100 lb. bodyweight gains for each 309 lb. of feed consumed; the corresponding food requirement for the undosed pigs was 335 lb. More recently Colovos, Keener and Teeri (1951), in tests with vitamin D-deficient calves, found the digestibility of both food protein and ash, the retention of absorbed nitrogen and the efficiencies of utilisation of energy and protein all to be diminished. If protein metabolism is adversely affected, there are reasonable grounds for supposing that hormone and enzyme syntheses, as well as tissue protein formation, are also disturbed. In addition to the frank clinical symptoms observable in vitamin D-deficient animals of all ages, there may thus be more insidious ones accompanying milder forms of avitaminosis-D and requiring for their detection a " keener eye " in both veterinary surgeon and farmer.

(4) The Vitamin D Content of Animal Feeding-stuffs

Although plants may be exposed to all available sunshine in the regions where they grow and although, in proportion to their weight, they offer a large surface area, yet for some reason or other, whether it be the screening of most of the plant foliage by the rest of the leaves or the interference of plant pigments, green fodders considered as a class are poor sources of vitamin D. Furthermore, since seeds are also deficient, it follows that the cereal grains, cereal by-products, oil-seeds and oil-seed meals commonly fed to livestock likewise lack the vitamin (except perhaps coco-nut cake, made from copra sun-dried in a tropical climate).

As with the solar irradiation of mammals and birds, so with plant materials the amounts of vitamin D which are produced depend upon the existence in the plant of suitable phytosterols as precursors and upon the nature and amount of ultra-violet light available. The evidence concerning the vitamin D content of foodstuffs of vegetable origin, especially that pertaining to the British Isles, is very scanty. Doubtless this is partly due to the difficulties of vitamin estimation, which, for preference, involves expensive bio-assays of solvent-extracted fat.

In the presentation of evidence concerning the vitamin D content of foods, one may neglect for the moment substances such as the vitamin-rich, fish-liver oils because (i) their number is so limited, (ii) they are not freely available to livestock in the natural state and, (iii) their employment is usually fairly well controlled and is restricted chiefly, though not entirely, to pigs and poultry.

The rest of the published information, as it applies to horses, cattle and sheep, may advantageously be surveyed under the following chief headings: (i) the vitamin D contents of grass and related crops, (ii) experiments which show changes of the vitamin D contents of crops in relation to methods of preparation, (iii) the stability of vitamin D and (iv) crop husbandry in relation to vitamin D. The first subdivision is useful since it shows field variations which reflect both the effects of weather conditions and the skill of the farmer. Data under the second heading demonstrate possible reasons for the variations occurring in the first classification.

(*i*) *The vitamin D contents of grass and related crops.*

Most of the vitamin D which is *ingested* by the three species just mentioned is obtained either from grass, or from its three conservation products, namely, dried-grass, hay and silage. Alleman (1942), examining Central European clover which had been grown under conditions bearing some semblance to those of Britain, found that the fresh material had a potency of about 120 I.U. per lb. American observers (Smith & Briggs, 1933) obtained results with lucerne which suggest that the fresh crop had a potency no higher than about 20 I.U. per lb. In " fully " green crops (lucerne) Moore and Thomas (1948a), also in the U.S.A., found no detectable amounts of the vitamin.

Hay is a much more variable source. Allemann (*op cit.*) recorded 600 I.U. of vitamin D per lb. of sun-dried clover

hay while Wallis (1949), as the result of a nation-wide (U.S.A.) survey, found that the vitamin D content of sun-cured lucerne hay might range from 60 to 1,000 I.U. per lb. For " prairie hay " the range was 500 to 700 I.U. Another American worker has reported a range of 144 to 276 I.U. per lb. for hay made during one year and of 820 to 900 I.U. per lb. during the following year (Newlander, 1948). It is unfortunate that no corresponding data for English samples are available but there is good reason to believe that such samples would prove no more uniform and probably be less rich in vitamin D than the better European or American samples (see below).

The diversity of vitamin D potencies is repeated, though on a lower level, in ensiled crops. For European clover silage values of 10 I.U. per lb. and for American products a range of 60 to 100 I.U. (with exceptional samples even as high as 400 I.U. per lb.) have been recorded.

(ii) *Vitamin D contents of foods in relation to production methods.*

Hay, dried grass and silage are here the principal foods of interest, with stage of growth at the time of collection, climatic conditions during that period and method of conservation the three most important aspects of technique for discussion.

Evidence has already been presented to suggest that fresh green crops contain no vitamin D. Moore and Thomas (*op. cit.*) have shown by biological assay that lucerne hay, cured with the crop at the seeding stage, contained more vitamin D than when the lucerne was cut at half-bloom. Poorest of all was hay made from lucerne in bud. These authors, while emphasising the need for further work, postulated that the observed differences were due to solar irradiation of *dead* foliage, the proportions of which at the three stages described were 6·5, 2·9 and 2·4 per cent. respectively. This important consideration underlines the need for considerable skill and judgment on the part of the farmer, even under the most favourable weather conditions.

As might be expected, the hay leaves are a quantitatively more important source of vitamin D than the stems. Wallis (1938b) under the relatively favourable conditions of S. Dakota (lat. 43° N.), found that the leaves of good-quality, field-cured lucerne hay can have a potency as high as 4,500 I.U. per lb., as compared with 800 I.U. for the stems, a difference which is probably a reflection both of leaf composition and of the favourable influence of a large surface area presented for irradiation. Other factors being equal, one would then expect leafy hays to be potentially better sources of vitamin D than the more stemmy varieties. It is noteworthy that Moore and Thomas (*op. cit.*) found the vitamin D potency of the air-dried, brown, dead leaves, which they collected from lucerne hay, to be 3,200 I.U. per lb.

When grass is taken for drying, for hay, or for the production of silage, the condition of the crop at cutting is one factor which affects the final vitamin D potency of the material, as described in the preceding paragraphs. Whatever is to be done ultimately with the cut herbage, the first step in conservation is nearly always the same, the material being left *in situ* for a few hours to wilt, so as to lose a good proportion of its moisture to the atmosphere. At this stage, depending upon the weather conditions, there is the chance of irradiation of the plant sterols and the formation of vitamin D. Where the crop is very green the opportunity afforded by the wilting process probably is not very favourable. This may account for low values recorded for barn-dried hay which has been removed from exposure to sunlight soon after wilting. Thus Allemann (*op. cit.*) quotes 45 I.U. per lb. for barn-dried clover as compared with 600 I.U. for ordinary clover hay. On the other hand, Moore and his collaborators in the U.S.A. (1948b) comparing barn-cured lucerne hay, which had been exposed to good sunshine for 12 to 16 hours before carting, with field-cured hay left out for 30 to 40 hours, in *good* weather, reported potencies of some 200 and 400 I.U. per lb. respectively.

In the next stage of hay making, the cut herbage may be left in the swath or windrow for a long period after wilting is finished. Wallis (1944) was at some pains to study the effects of different techniques during this stage of processing. The formation of vitamin D in lucerne hay was as rapid in small windrows as in the swath, but, under fairly good weather conditions, when the crop was dry enough to haul, its potency was still only 270 I.U. per lb. After six days of such drying, the potency had risen to 600 I.U., by which time, however, the hay was dry, broken and no longer green.

The same worker found that after several days' exposure hay in cocks showed a vitamin D content no higher than 50 to 100 I.U. per lb. ; even then the vitamin had been formed only in the outer layers of the cocks, thus showing the influences of screening and of area of exposure on vitamin D synthesis. A similar phenomenon was observed to occur in large windrows, the production of the vitamin again being slow.

Grass silage depends for its vitamin D content upon such factors as already have been described. If taken green its potency is low ; if taken when the herbage has begun to turn brown, a potency as high as 200 I.U. per lb. may be found (Moore *et al.*, *op. cit.*).

Such factors as the latitude of the place where the hay is being produced, the amount and distribution of rainfall and the amount of cloud experienced affect the quantity of vitamin D in the final crop. Because there are so many interfering factors, however, one would not expect to find it easy to produce clear-cut evidence with regard to any one of the three above. Marked variations of the vitamin D content of hays produced by the same workers at the same places in successive years have several times been reported and some at least, if not all of such variation, must be ascribed to weather conditions.

(iii) *The stability of vitamin D.*

On the basis of early tests, which really showed nothing more than that vitamin D was far more stable under specific conditions than vitamin A, the stability of the former under all conditions was too long taken for granted. Although it is nearly 10 years since Fritz, Archer and Baker (1942) showed that vitamin D, when associated with certain types of foodstuffs, may lose as much as 80 per cent. of its activity within one month of storage, few references to such phenomena are to be found even in present-day literature. Minerals in natural foods and in some mineral supplements, *e.g.*, limestone, can produce this lowering effect. On the other hand, other foodstuffs, of which soya-bean meal is one, are able to give partial protection to the vitamin D with which they may be compounded. Since, however, substances so diverse in chemical composition as limestone, sand, sucrose and lactose may all produce destruction of the vitamin, it is very difficult to generalise ; all that the four substances listed above appear to have in common, for example, is a large surface area per unit weight.

With regard to hay there is little or no direct evidence. During hay-making the dry-matter of the original herbage inevitably becomes more concentrated. As the result of this concentration is the stability of the vitamin D adversely affected ? In legume hays, which tend to have higher mineral, and especially calcium, contents than grass hay, is the vitamin D correspondingly less stable ? As yet there appear to be no answers to such questions, important though they may be for the health of livestock.

(iv) *Crop husbandry in relation to vitamin D.*

The very factor which promotes the formation of vitamin D in hay is precisely that which tends to destroy provitamin-A,

i.e., carotene. Many classes of livestock derive all of their vitamin A from pasture or from suitably produced hay and dried grass. In recent years much attention has been paid to preserving the carotene content of such crops, not merely for the sake of the pro-vitamin but also because young herbage contains a relatively high proportion of protein, while its fibre, being unlignified, is easily digestible.

To quote first from an American authority on crops and crop husbandry, Wheeler (1950) says " high-grade timothy and clover hay may be defined as hay cut at the proper time, properly cured, with a large amount of natural green colour " and " hay producers are using practices that will conserve the maximum of green colour in the hay." The same author says that " livestock relish green hay " and comments adversely on the lack of palatability of sun-bleached hay. It is recommended also that lucerne should be cut for hay at the one-tenth to one-fourth bloom stage ; commonly the hay is baled on the same night as when it is cut. Timothy is recommended to be cut at the full-head to full-bloom stage and clover when half of the plants are in full-bloom. Typical advice in Britain is that of Ede (1946) who says " cut the crop when it is green " and adds that hay should not be " lacking in colour." In this instance cutting at the flowering stage is recommended for hay, with the stipulation that it is better to cut early rather than too late. So far as carotene, protein and fibre are concerned, this is excellent advice, but there is no doubt that such precepts scarcely favour the formation of vitamin D.

What some of these suggestions may imply in terms of vitamin D is provided in the recent paper of Thomas and Moore (1951). In the case of lucerne, the vitamin D content of the forage at various stages was as follows : bud, 96 ; half-bloom or hay, 145 ; seed or mature, 291 ; and field-cured, 740 I.U. per lb. respectively. The first stage (bud) of the crop was attained on August 6th, the dates corresponding to the next two being August 18th and September 3rd, so that the changes may be attributed to good solar irradiation.

In Britain the taking of the crop for hay while it is still very green, the undependable weather conditions which may pertain here even in summer, the early cocking of hay, its barn-drying and similar practices (which are aimed at overcoming adverse climatic conditions), all of these factors, though they may tend to preserve carotene, must diminish the chances of the hay containing even moderate proportions of vitamin D. This problem needs early attention. Present agricultural methods, from the best of motives, may now be overstressing the value of the flush-of-growth period of herbage at the expense of the later one.

(5) The Total Amounts of Vitamin D Available for Livestock

Evidence has been given previously of the amounts of vitamin D present in foodstuffs or which are potentially available through the action of sunlight on the skin of the animal. The chief foodstuffs concerned are hay and silage, the animals mainly involved being cattle, horses and sheep.

The amounts of hay which are fed to cattle and horses may vary considerably, but a useful picture of the general situation in Britain may be derived from the assumption of an intake of 10 to 15 lb. per day for a beast weighing 1,000 lb. In view of the variable vitamin D potencies of hay which are recorded in the literature and of the many factors which are operative, the assumption of a value of 300 I.U. of vitamin D per lb. for English hay is probably generous. Provided that the vitamin D does remain stable, this would lead to dietary vitamin D intakes of 3,000 to 5,000 I.U. per day, during that part of the year when hay is being fed. In the case of the exceptionally high-yielding dairy cow, the quantity of hay given could easily fall below the figure suggested.

Although silage is a possible source of vitamin D, nevertheless in the feeding of most classes of livestock, this foodstuff often provides a replacement for hay rather than an addition to it.

With regard to the vitamin D-producing powers of sunlight, the calculations of Part I of this paper (Abrams, 1952*a*) were based upon (*a*) physical and astrophysical data concerning sunlight, (*b*) meteorological records for the British Isles and, though to a much more limited extent, for the U.S.A. and (*c*) irradiation experiments with *rachitic rats*. Data obtained for a given species certainly should not be applied to another without due consideration, but there is good evidence, to be presented later, regarding the validity of the assumptions which have been made. Meanwhile the following points can be made with regard to livestock in Britain.

Firstly, although the irradiation of the skin of an animal is a surface effect, the particular surface, so far as direct sunlight is concerned, is not that of the whole skin but is only the area, measured normally to the direction of the solar beam, which the animal intercepts. One might well use the word " profile " to describe it, if that word had not already been used in the field of metabolism and heat loss (Brody, 1945) ; instead, " silhouette " will be employed.

Secondly, if vitamin D requirements are proportional to bodyweights, then since irradiation relates to surface and not to bodyweight, the larger species of animals, which have smaller skin surfaces in relation to their weights, will be worse off than the smaller species. The conventional large animal of 1,000 lb. weight thus presents the most difficult practical case and the one needing most consideration. Where sunlight and vitamin D are involved and other factors are equal, the 5-lb. cat is some six times better off than the 1,000-lb. horse.

The *total* skin area of a 1,000-lb. animal is of the order of 45,000 sq. cm. (Brody, *op. cit.*) but the amount which is exposed to the direct rays of the sun varies with the movements of the animal. Simple tests here have shown that where the grazing animal moves along a path at right-angles to the direction of the incident light the silhouette is about 15,000 sq. cm., but unless the creature so orientates itself all day long, the average area of the silhouette will be approximately 8,000 sq. cm.

Now the annual vitamin D-producing capacity of direct sunlight in Britain, depending upon the latitude of the place concerned, has been estimated to lie within the limits of 130 to 220 I.U. per sq. cm. of body surface normal to the solar beam (Abrams, 1952). There are, however, certain operative factors, whose precise influence is unknown, which may affect the validity of the estimate. These must now be considered.

There are at least three factors which may indeed lead to less than the above amount of vitamin D being formed, namely (*a*) poorer general atmospheric conditions in Britain than in Marseilles, where some of the astrophysical observations were made, (*b*) the insensitivity of the Campbell-Stokes sunshine recorder, which results in no differentiation between full sunlight from clear skies and sunlight which has passed through enough dust and water vapour to rob it of some or all of its ultra-violet component and (*c*) the fact that livestock are normally housed, or are in sheltered positions, during quite a large proportion of the hours of sunshine.

Tending to increase the estimates are (*d*) irradiation of the animal by reflected ultra-violet light (" skyshine ") and (*e*) the possible but, in the writer's opinion, improbable assumption of too low a value for the measured energy of the rays of the antirachitic fraction of sunlight. An increase of 25 per cent.

is all that the first factor would warrant, while consideration of the published data suggests that if the second factor is involved at all, the maximum increase would be 75 per cent.

With regard to (*f*), the operative biological factors and (*g*) variations in the density of the ultra-violet-absorbing, ozone layer of the upper atmosphere, there is evidence (to be given in Part III) that the skin texture and pigmentation of the larger animals are likely to lead to the formation of less vitamin D than has been postulated here. Furthermore, as previously indicated, Fabry and Bouisson's measurements, made when the ozone layer was thin, thus seem to point in the direction of diminished, rather than increased, vitamin D production.

As a result of such considerations the following probable annual mean values and limits are suggested for the vitamin D-producing potentialities of sunlight in the British Isles (expressed in I.U. of the vitamin per sq. cm. of normally exposed surface) :—

Latitude : 50° N. 220 I.U. ; limits 150 to 330.
60° N. 130 I.U. ; limits 80 to 200.

The 1,000-lb. beast, with 8,000 sq. cm. of skin surface for irradiation, thus would derive the following amounts of the vitamin daily from sunshine :—

Latitude : 50° N. 4,500 I.U. ; limits 3,000 to 7,000.
60° N. 3,000 I.U. ; limits 2,000 to 4,000.

By way of contrast, the corresponding values for latitude 40° N., which may be taken as the mean latitude of the U.S.A., would be 6,500 with limits 4,500 to 10,000 I.U. This would apply even with weather conditions no better than those in Britain, an assumption that is far from the truth.

To the above quantities must be added the 3,000 to 5,000 I.U. per day which might possibly, though not necessarily probably, be derived from ingested hay. How far the essential conditions for the realisation of these total intakes of vitamin D are likely to be met with in the field and whether the amounts are reasonably adequate must be considered in the light of present methods of animal husbandry in Britain.

CLINICAL COMMUNICATION

SPLENECTOMY IN THE DOG

J. V. S. RUTTER, M.R.C.V.S.,
Hereford

Subject.—Bull Terrier bitch, aged 10 years.

History.—The patient had been losing weight for the past month or two and recently had been off food and showing signs of abdominal discomfort.

The bitch was in poor condition, anaemic, and with pendulous abdomen. The lungs displayed an asthmatical condition which the owner said had existed for two or three years. Palpation of the abdomen revealed a large hard mass which was somewhat loosely diagnosed as an abdominal tumour. Exploratory laparotomy was suggested and the owner agreed.

Operation.—Anaesthesia was induced by the intravenous injection of nembutal—rendered more hazardous by the condition of the lungs and heart. A median incision was made through the skin and abdominal muscles and on incising the peritoneum a large dark mass protruded through the operation wound. At first sight, this looked like a lobe of the liver but examination showed it to be part of a greatly enlarged spleen. The operation wound was extended and the spleen drawn out until the splenic artery and vein were exposed. These were ligatured with catgut. The main blood vessels of the splenic omentum were included in one major ligature. The splenic artery and vein were then severed, the omentum broken away with the fingers and the whole spleen removed, there being practically no haemorrhage. The abdominal muscles were sutured with a continuous nylon suture and the skin wound closed with silk Halstead sutures. An injection of Rephrin was given during the operation, as respirations became very shallow. A further 1 c.c. of Rephrin was given immediately after the operation was completed.

The patient was semi-comatose for 24 hours following the operation but from then on commenced taking liquid food and at the time of writing (one month later) has a good appetite and appears to be making an uneventful recovery. The operation wound healed perfectly, sutures being removed on the seventh day. A feature of the case is that the asthmatical symptoms have now practically disappeared. The spleen weighed 2 lb. and was 13½ inches long and from 2½ to 6 inches wide.

[*Photo : Geoffrey Hammonds, Hereford.*

Microscopical examinations.—Blood examination suggested a leukaemia of the myeloid type : polymorphs 84·5, lymphocytes 11·0, monocytes 4·0, blast cells 0·5; normoblasts, 11·5 per 100 white cells. This finding was borne out by histological examination of spleen sections, in which the normal arrangement of the splenic tissue was completely obliterated and replaced by neoplastic cells. There was no encapsulation of the neoplasm, though the normal spleen capsule had not been infiltrated by the growth. Mitoses were fairly numerous amongst the neoplastic cells.

The accompanying photograph of patient and spleen was taken three days after the operation.

Weekly Wisdom

There was far too much making everything easy for the children. Nowadays, it seemed a sin even to suggest that a little honest work at things they did not like might be good for their pupils. The unpleasant truth was that until children grew up to do a good honest day's work, without continually expecting to get more money for doing less work, and without expecting something for nothing, there would be no real improvement in our standard of life.—Mr. F. W. Ridgewell, of Beckenham and Penge County Grammar School, in his address, as retiring Chairman, to the Incorporated Association of Assistant Masters in Secondary Schools.

* * * * *

The B.R.X. Club.—Attention is drawn to the notice in this issue of the annual dinner, B.R.X. Club. This club, which was formed by students of the Royal Veterinary College during and immediately after the war years 1939-45, has a widespread membership including many abroad. The Secretary is particularly anxious, therefore, that any member who has not received the customary notice but intends to be present should write to him direct as soon as possible.

ABSTRACTS

Infection and Resistance in Young Animals*

This subject was chosen by the author for his presentation of the Almroth Wright lecture of 1951.

The variation in incidence of disease in animals and man is related to many factors such as the invasiveness of the causal organism or the state of immunity of the host. While some diseases do not exhibit any variation in incidence according to the age of the host, others attack definite age groups such as the mature animal or the animal in early life, but this variation is not necessarily correlated with the state of immunity of the respective groups.

Certain examples of disease exhibiting an age relationship are given—*viz.* : *Br. abortus*, *Str. agalactiae*, *C. renale* and *Babesia bovis* infections of the adult animal.

Though the clinical occurrence of Johne's disease is seen in cattle of two to three years of age, susceptibility to infection is thought to be at its highest up to six months. Many nifectious diseases do not occur in the newly born and very young of both man and animals, due to the passive immunity from the mother which they enjoy, but both species are affected by a gastro-enteritis associated with *Bact. coli*. By serological and other *in vitro* tests it is possible to distinguish various races of *Bact. coli* isolated from calves and there is a tendency for particular strains to become established in an enclosed group of calves. The view expressed by Theobald Smith that the protective value of colostrum is due to the immunity conferred by it on the calf has been confirmed by Lovell and his co-workers, who have shown that this is related specifically to its *Bact. coli* agglutinin content.

Further examples are given of the passive transference of immunity from mother to young and its relationship to the placentation of the different animals is discussed.

S. J. E.

* **Infection and Resistance in Young Animals.** Lovell, R. (1951.) *Lancet*. **2.** 1097.

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Ruminal Volatile Acids and Ketosis*

Since the discovery by McAnally and Phillipson that the organic volatile acids are absorbed through the walls of the rumen, it has become increasingly evident that these acids constitute a major source of energy for the ruminant. Determination of the proportionate amounts of acetic, propionic and butyric acids making up these volatile acids presents a significant problem. Various workers have shown that the rate of disappearance of the acids in an acid medium was, in descending order, butyric acid, propionic acid and acetic acid, but their analytical methods are open to question. Other workers did prove satisfactorily that propionic acid is absorbed more rapidly than acetic acid from the rumen when the contents are acid in reaction. Some publications have suggested that propionic acid is absorbed much more rapidly than either acetic or butyric acid.

The present work shows that butyric acid was absorbed with considerably more rapidity than was propionic acid, which, in turn, was absorbed more than was acetic acid. The work was carried out on female goats, in which rumen fistulae had been established. The volatile acids were removed from the rumen samples and prepared for chromatography. After the animal on experiment had been starved for 72 hours the rumen was massaged and a sample taken. A solution containing equimolar proportions of propionic acid and butyric acid with potassium hydroxide to approximate the base in the food was dripped into the rumen at the rate of 300 ml. per hour for three hours. A second rumen sample was taken 15 minutes after the injection was completed and a third three hours after the first. The experiment was repeated with varying concentrations of the volatile acids and different rates of administration. In all cases the rate of absorption of the volatile acids from the rumen was in the order butyric acid > propionic acid > acetic acid.

Assuming that almost all the carbohydrate that is ingested is absorbed by the ruminant as volatile acids and that approximately equal amounts of propionic and butyric acid are produced, the author postulates that it is possible to place the problem of ketosis on a theoretically understandable basis. One of the perplexing problems of bovine ketosis has been that the blood glucose level can be raised and that of acetone caused to drop by relatively small parenteral injections of glucose, whereas little or no beneficial effect can be obtained with oral carbohydrates, except when they are given in very large quantities. This problem is solved if it is realised that only the propionic fraction, which is about one-fifth of the total carbohydrate fermented, is a glycogen precursor. It is then clear that for an adequate supply of carbohydrate in the blood stream, the animal must depend to a large extent on the process of gluconeogenesis from such possible sources as propionic acid, protein and the glycerine portion of fat. It follows that not only are the absolute quantities of the various volatile acids produced of importance but the relative proportions must be taken into account since propionic acid is the important glycogen precursor. The author also claims from unpublished work that when equal amounts of propionic acid and butyric acid are received by the animal the rise in blood glucose is far less than if the same quantity of propionic acid alone is received, while the rise in ketones is less than if the same quantity of butyric acid alone is received. Acetic acid has little effect on either the blood glucose or ketone levels.

It is possible, then, that herds experiencing a high incidence of ketosis are fed rations that yield larger than normal amounts of butyric acid and smaller than normal amounts of propionic acid. It has been shown that cows fed grass silage excrete more ketones than they do when it is omitted from their diet. The ingestion of silage may constitute a constant inoculation of the rumen contents with butyric acid-forming organisms with the consequent production of large amounts of butyric acid.

In an earlier paper (*N. Amer. Vet.* 1951. **32.** 327) the author applies his observations to methods of treating ketosis and suggests that glycerine given by mouth can be absorbed and used as a glucose precursor. Glycerine is not toxic except in enormous doses and then causes only some diarrhoea. Successful treatment of three cases is claimed with twice-daily doses of 500 grammes of glycerine mixed in the grain of the feed.

G. F. B.

* The Relative Rates of Absorption of the Volatile Acids from the Rumen and their Relationship to Ketosis. Johnson, R. B. (1951.) *Cornell Vet.* **41.** 115-121. (Two tables, 23 refs.).

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Thiouracil Supplement for Fattening Pigs*

Thiouracil has an inhibitory effect on the thyroid gland, and this results in a decreased metabolic rate with some obesity. Pigs treated with thiouracil over a period of 28 days have been known to show an improvement in their live-weight increase. Such animals tend to be wider, shorter and fatter than control pigs, and this suggests some retardation in growth.

* Thiouracil as a Supplement in Rations for Fattening Pigs. Robinson, K. L., & Coey, W. E. (1951.) *J. Sci. Food & Agric.* **2.** 365-371.

Experiments were carried out in which pigs receiving 0·1 per cent. thiouracil in the meal ration increased in weight from 150 to 210 lb. a week earlier than the control pigs. This gave a saving of about 45 lb. (20 per cent.) in meal. As compared with control animals, younger pigs showed a tendency to extend the period required to increase from 100 lb. live weight to 210 lb. The saving of food was up to 75 lb. per head (17 per cent.). It would appear that thiouracil may reduce the desire for water on the part of the treated pig. Sex (females and castrated males) does not seem to be a very important factor in the reactions obtained. In some instances the results of feeding pigs with 0·1 per cent. thiouracil from 150 lb. live weight were obtained without significant effects on carcase conformation. In many of the experimental pigs a hypothyroid condition was set up and showed itself in an enlargement and altered appearance of the thyroid glands.

D. J. A.

REVIEW

our Thousand Million Mouths : Scientific Humanism and the Shadow of World Hunger. Edited by F. Le Gros Clark and N. W. Pirie. Oxford University Press, [FAmen House, London, E.C.4. Price 12s. 6d.]

This book, containing 11 essays in semi-popular form by specialists in the science of food production, must act as a stimulus to those who wish to see a world-wide drive to master the problems of producing and preserving food. If this problem were efficiently tackled countries would be able to maintain their own populations and in some cases produce surpluses which could be distributed where necessary.

The essayists demonstrate that new knowledge can show how to increase soil fertility, and how to develop crops suitable for individual countries, and thus help to improve animal production by raising the standard of nutrition. At the same time it is emphasised that all advances in technique must not be nullified by waste, either of animal or vegetable materials. The efficiency with which waste products and residues are used is an important controlling factor in the ultimate number of people the earth can hold and the standard of living that they can expect.

It is alarming, and at the same time encouraging, to realise that many of our methods of waste disposal and of food preservation are still very primitive, and that even a small measure of improvement would lead to an increased soil fertility and thus to a more planned supply of food of all sorts.

Essays are contributed on the Malthusian Heritage ; Soil Conservation ; Manuring for Higher Yields ; Growing Healthier Crops ; Genetics and the World's Food ; Improving the Milk Supply ; The Pig as a Producer of Food ; Catching and Preservation of Fish ; The Circumvention of Waste ; and the Processing of Food.

The theme of the book is expressed in the following words : " The world's population has been largely created by the uneven application of science ; the solution depends on whether the farmer and biochemist can restore the balance between food and population which the doctor and the engineer have upset—hitherto disease and continence have been the pre-eminent checks on population, the former is the more important as it is rapidly being abolished by science. Only a community penetrated by science will be sufficiently thoughtful not to outbreed its resources."

Malthus is usually quoted when the problem of population increase is discussed, and he saw the danger of a rapidly growing population which might well outstrip its food resources. Each war brings its warning to the people of this country, of the danger of over-population, but the solution of the problem always seems to be ahead of the investigators.

In the temperate zones of the world remarkable balance in agriculture can be maintained, but in tropical zones where vast prairies and deserts occur, such as in parts of Africa and Australia, severe drought or torrential rain can alter any well-conceived plan for the future. As this is written, drought and prairie fires in Queensland have led to that cattle-rearing country importing meat.

This book points the answers to many of the problems of food production, but as we know from experience, it is not always easy to put the correct methods of husbandry and crop management into practice. Primitive methods of agriculture are usually associated with primitive people and, therefore, there is no point in endeavouring to improve the standards of agriculture over a wide area too rapidly in these countries. We have seen from the experience of the Colonial Development Corporation that the most well-meaning of schemes can fail rapidly if the local population are not capable of putting them into practice, or the full extent of local difficulties has not been studied.

At the moment it would appear that those countries which have developed a high standard of agriculture can continue to improve their standards, and at the same time reduce the wastage of foodstuffs and animal products that occurs at present. All experiments in tropical countries should begin on a very small scale and develop as the local people come to understand the advantage of the improvements which they can see.

IN PARLIAMENT

Poaching of Deer (Scotland) Bill

In the House of Lords on March 13th, the Earl of Home, Minister of State for Scotland, moving the second reading of the Poaching of Deer (Scotland) Bill, said that the two objects were to strengthen the law against deer poaching and to prevent the appalling cruelty involved in modern gang poaching. The only mention of red deer in any previous legislation was in an Act of 1832 that imposed a fine of £20 for poaching but did not provide for the right of search or forfeiture of weapons or vehicles which were necessary in dealing with the modern poacher.

Poaching was now largely carried out by gangs who went out by vehicles from towns many miles away from the deer forests. They carried out their operations mostly in winter or spring, when the deer, out of condition, were little use for human consumption. They did a great deal of their poaching by night. In hard weather the deer went down to low ground, often close to the road. A very bright headlight was switched on and the deer were shot up by rifles or automatic weapons. The dead deer were then put into the lorry, and the wounded and maimed were allowed to struggle away over the hills. The practice was revolting by every standard of sportsmanship, humanity, and decency, and the Bill struck at those who followed it to make quick money when meat was scarce. There was provision for penalties of £20 for the first offence on summary conviction, and a fine of £100 or two years' imprisonment, or both, in cases of conviction on indictment. A gang was defined as two persons or more, since the gang often split up into pairs.

There were two apparent weaknesses to which attention had been called in the Press—powers of arrest were given only to policemen, and the Bill did not at present include a close season for deer. Powers of arrest should not be given to stalkers, who were private servants. There was a definite risk in dealing with poachers who inevitably carried firearms. On a close season, he said that the Government was most sympathetic and would keep the question open until the committee stage in the hope that agreement between

the various interests might be reached. The Government must be satisfied that agriculture was safeguarded and then they would be prepared to put a close season into the Bill before it left for the Commons.

The Bill was read a second time after debate, in which noble lords urged the imposition of a close season and regretted that the power of arrest and search was to be confined to police constables.

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Questions

Transport of Cattle by Air

Mr. Anthony Greenwood (March 11th) asked the Minister of Agriculture when it is intended to introduce regulations regarding the transport of cattle by air, on lines similar to those relating to the transport of cattle by rail or sea.

Sir T. Dugdale: The transport of cattle by air in any numbers is a very recent development, but I am having the possibility of making regulations examined.

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Aged Horses (Care)

Mr. Peter Freeman (March 10th) asked the Minister of Agriculture if he will institute either a compulsory or voluntary pension scheme whereby horses employed by local authorities, the Railway Executive and other industrial users of horses, farmers and racehorse owners, can be assured of a reasonable period of retirement in suitable homes of rest after service to their owners and to the community.

Sir T. Dugdale: No, I think that this should be the responsibility of owners of horses and not of the Government.

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Domestic Animals (Ill-treatment)

Mr. Donald Chapman (March 13th) asked the Secretary of State for the Home Department how many successful and unsuccessful prosecutions for ill-treatment of domestic animals were made in 1951, or the latest convenient period of one year; whether his attention has been called to the number of additional warnings issued to offenders by the Royal Society for the Prevention of Cruelty to Animals; and whether he will draw the attention of magistrates to their powers of imprisonment in cases of proved ill-treatment.

The Secretary of State for the Home Department (Sir David Maxwell Fyfe): The criminal statistics do not distinguish between offences of ill-treatment of domestic and other animals. During the 12 months ended September 30th, 1951, 1,012 persons were charged with offences of ill-treatment, of whom 869 were convicted. Of these 26 were sentenced to imprisonment. I have no reason to think that magistrates are unaware of their powers. I have no knowledge of the circumstances in which warnings were given by the R.S.P.C.A. to persons who were not charged with an offence.

Mr. Chapman: Is the Home Secretary aware that the R.S.P.C.A. is now issuing, every year, something like 11,000 oral warnings, in addition to many other kinds of warning, to people who ill-treat animals? Is he further aware that a man who beats a dog to death with a crowbar is fined a miserable £7? Is he satisfied that the magistrates are really using their powers of imprisonment to try to stamp out this sadism in our national life?

Sir D. Maxwell Fyfe: I have no reason to think that magistrates are unaware of their powers. I should also like to say, as I have said on so many other occasions, that I am not going to be a party to the Executive giving directions to magistrates as to how they should do their work. I think that magistrates, who have the whole facts of each case before them, can best decide the appropriate penalty. Much as I regret—as does everyone in the House—the existence of these offences, I am not going to depart from that principle. On the other hand, the raising of the point by the hon. Member for Northfield (Mr. Chapman) and the obvious unanimity of feeling against these offences will go out from this House to the country.

Miss Irene Ward: As a magistrate, may I ask my right hon. and learned Friend whether he is aware that I think the maximum sentences which can be imposed are too light and that they should be raised? Will he please consider this question from the point of view of a magistrate?

Sir D. Maxwell Fyfe: I should like to assure the House that all the words of wisdom which proceed from my hon. Friend are duly noted by me.

Mr. Chapman: In view of the unsatisfacfory nature of the reply, I beg to give notice that I propose to raise the matter on the Adjournment.

Wild Bird Protection Acts

Major Tufton Beamish (March 13th) asked the Secretary of State for the Home Department on what date he received the Report of the Committee which advises him on the administration of the Wild Bird Protection Acts of 1890 and 1933; and what prospect there is of new legislation, in view of the fact that these Acts are badly in need of revision.

Sir D. Maxwell Fyfe: The Committee's proposals for new legislation, were submitted on September 24th, 1951. At present I can only say that there will not be time for legislation on this subject this Session.

Major Beamish: Will my right hon. and learned Friend bear in mind that there is a real need for amending legislation and that it would be very pleasant, at this time of so much political controversy, to discuss wild birds during a short breathing-space.

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Casualty Animals (Slaughtering)

Mr. Philips Price (March 13th) asked the Minister of Food whether he will arrange, with a view to preventing delay in the slaughter of accidentally-injured stock, that the name, address and telephone number of the slaughterman on duty shall be posted outside every abattoir when this is closed, and notified to all veterinary practitioners in the area served by it.

Major Lloyd George: It would not be practicable for my Department to undertake to provide a 24 hours' service every day of the week at slaughterhouses and consequently provision is made in the Livestock (Restriction on Slaughtering) Order to permit casualty stock requiring immediate slaughter to be dealt with on the farm or elsewhere provided that within 24 hours the carcase is delivered to a Government slaughterhouse or notice is given to the nearest district chairman of auctioneers.

Local arrangements have been made voluntarily in many places by the slaughtering contractor, and in agreement with the farmers' organisation, for a slaughterman to deal with casualty animals outside normal working hours and for his name and address to be posted up outside the slaughterhouse.

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Sheep Worrying

Lieut.-Commander Baldock (March 13th) asked the Minister of Agriculture whether he will now give the figures for the number of sheep killed and worried by dogs during 1951.

Sir T. Dugdale: According to reports from county councils there were approximately 5,700 sheep killed and 5,200 injured by dogs during 1951.

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Cattle Ranching Scheme, Northern Bechuanaland

Mr. Hale (March 13th) asked the Under-Secretary of State for Commonwealth Relations whether he will make a statement on the progress of the cattle ranching scheme in Northern Bechuanaland; and whether he is satisfied that adequate provision has been made in case of drought.

Mr. J. Foster: The Colonial Development Corporation will publish details of the progress of this scheme in their annual report for 1951. Provision against drought is a matter of ranch management; the project is still in its very early stages, but I understand that the Corporation are satisfied that reasonable precautions will be taken.

Mr. Hale: But in my Question I asked the Under-Secretary whether he is satisfied that sufficient provision has been made against the possibility of drought? Experts are saying openly that no provision has been made. Will the hon. and learned Gentleman tell us what is his own view on this matter?

Mr. Foster: The Corporation must be liable for the precautions, and I understand from the Corporation that reasonable precautions will be taken.

Mr. Hale: What precautions have been taken?

Mr. Foster: The detailed precautions are a matter for the Corporation.

Mr. Gordon Walker: Does the hon. and learned Gentleman realise that his noble Friend is, of course, responsible for the broad direction of this project and will he bear in mind that the tendency of people engaged in this sort of thing is to start off on too big a scale—[Hon. Members: "Oh!"]—it will be just the same now as it was in the past—and also the necessity of seeing that their experiments are kept small enough and no bigger than is necessary to establish the facts?

Mr. Foster: I will naturally bring that point to the attention of my noble Friend.

NOTES AND NEWS

Diary of Events

Mar. 25th.—Meeting of the Southern Counties Division, B.V.A., at Winchester (Royal Hotel), 6 p.m.

Mar. 26th.—Meeting of the North Wales Division, B.V.A., at Denbigh (Old Grammar School, Park Street), 2 p.m.

Mar. 26th.—Meeting of the Association of Veterinary Teachers and Research Workers (Northern Region) at the School of Agriculture, Sutton Bonington, Loughborough, Leics, 11 a.m.

Mar. 27th.—Annual General Meeting of the Western Counties Division, B.V.A., at Exeter (Imperial Hotel), 11.30 a.m. Annual Luncheon 1 p.m. Afternoon Session 2 p.m

Mar. 27th.—Meeting of the South-Eastern Division, B.V.A., at Maidstone (Royal Star Hotel), 2.30 p.m.

Mar. 28th.—Yorkshire Division, B.V.A. Dinner-Dance at Leeds (Parkway Hotel).

April 2nd, 3rd and 4th.—Meetings of Committees and Council, R.C.V.S., at 10, Red Lion Square, London, W.C.1.

April 3rd.—Meeting of the Central Division, B.V.A. in the Royal Veterinary College, N.W.1, 10 a.m.

April 3rd.—Meeting of the Lincolnshire and District Division, B.V.A., at Lincoln (Saracen's Head Hotel), 2.15 p.m.

April 4th.—North of England Division, B.V.A., Dance in aid of the V.V.B.F., at the Park Hotel, Tynemouth.

April 5th.—Annual Dinner of the B.R.X. Club, at the Royal Veterinary College, N.W.1, 7 p.m.

April 9th.—Meeting of the Association of Veterinary Teachers and Research Workers, at the Royal Veterinary College, London, N.W.1, 10 a.m.

June 4th.—109th Annual General Meeting of the Royal College of Veterinary Surgeons, at 10, Red Lion Square, London, W.C.1, 12 noon.

June 4th.—Annual General Meeting of the Victoria Veterinary Benevolent Fund, at 10, Red Lion Square, London, W.C.1,—immediately following the above.

June 4th to 6th.—Meetings of Committees and Council, R.C.V.S., at 10, Red Lion Square, London, W.C.1.

Sept. 8th—13th.—Seventieth Annual General Meeting and Congress of the British Veterinary Association, at Harrogate.

B.V.A. Quarterly Meetings in Edinburgh

The following are the arrangements for the quarterly meetings of the British Veterinary Association to be held in the Royal (Dick) School of Veterinary Studies, Edinburgh, on April 29th and 30th, and May 1st:—

Tuesday, April 29th:
12 noon. Home Appointments Committee.
2.15 p.m. Veterinary State Medicine Committee.

Wednesday, April 30th:
10.30 a.m. Organising Committee.
12 noon. Parliamentary and Public Relations Committee.
2 p.m. General Purposes and Finance Committee.

Thursday, May 1st:
11 a.m. Council.

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PERSONAL

Colonial Veterinary Service Appointments

The following appointments in the Colonial Veterinary Service are announced: Dr. J. Anderson, B.Sc., Ph.D., M.R.C.V.S., Senior Veterinary Research Officer, Kenya, to be Assistant Director of Veterinary Research, Kenya; Mr. D. E. Faulkner, B.V.Sc., M.R.C.V.S., Deputy Director of Veterinary Services, Kenya, to be Director of Veterinary Services, Nyasaland; Mr. R. S. Marshall, M.R.C.V.S., D.V.S.M., Deputy Director of Veterinary Services, Nigeria, to be Inspector-General of Animal Health, Nigeria; Mr. S. L. H. Walshe, M.R.C.V.S., Senior Veterinary Officer, Sierra Leone, as Senior Veterinary Officer, Gambia, and Mr. C. W. Wells, B.Sc., M.R.C.V.S., Chief Veterinary Officer, Singapore, as Deputy Director of Veterinary Services, Federation of Malaya. The appointment also is announced of Mr. J. E. Beaumont, M.R.C.V.S., as Veterinary Officer, Kenya.

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Other Appointment.—Reginald Arthur Green, Ph.D. (Cantab.), B.Sc. (Zool. Lond.), M.R.C.V.S., has been appointed Lecturer in Veterinary Anatomy in the Department of Zoology, University of Cambridge, with tenure of office from January 1st, 1952, for three years.

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Births.—Melrose.—On February 26th, 1952, at Reading, to Charlotte (Betty), wife of D. R. Melrose, B.Sc., M.R.C.V.S.—a daughter.

Murray.—On March 9th, 1952, to Monica (*née* Dowley), wife of Hugh Patrick Murray, M.R.C.V.S., a daughter—Gillian Mary.

Singleton.—On March 7th, 1952, to Hilda, wife of W. Brian Singleton, M.R.C.V.S., a son—William Anthony.

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Marriage.—Goodwin—Dean.—On March 5th, 1952, at Burnley, Robert Goodwin, M.R.C.V.S., youngest son of Mr. and Mrs. R. Goodwin, of 35, West High Street, Kirkintilloch, to Anne Elizabeth, youngest daughter of Mr. and Mrs. A. L. Dean, of Varenna, Simonstone, Nr. Burnley.

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Will.—Mr. James Fyfe Taylor, M.R.C.V.S. (retired), Cathkin, Rutherglen, left £12,736.

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R.C.V.S. OBITUARY

Burnet, James Henry, 9809-103rd Street, Edmonton, Alberta, Canada. Graduated London, July 24th, 1896. Died February 20th, 1951; aged 81 years.

Gillett, Edward Scott, *C.I.E.*, Lieut.-Colonel R.A.V.C. (retd.), Deputy Director Remounts, India, 1915-20. Graduated London, July 13th, 1900; died at Tucson, Arizona, aged 76 years. (Undated notification just received.)

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The Late Mr. J. H. Burnet, M.R.C.V.S.

Mr. James Henry Burnet, whose death we record above with much regret, was born in Sidmouth, Devonshire, and after graduating at the London College, went to Canada, now 39 years ago, residing and practising at the coast until the beginning of the First Great War.

He joined the first contingent, Canadian Army Veterinary Corps, and served in France and Belgium for three and a half years, retiring with the rank of captain.

Mr. Burnet went to Edmonton, Canada, in 1918 and for a number of years was with the Federal Department of Agriculture there.

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PRESENTATION OF BAXTER PRIZE AWARDS

Minister's Tribute to Sir Thomas Dalling

In our last issue we announced that, at a ce'ebration lunch in London early this month, the 1951 Thomas Baxter prizewinners, Sir Thomas Dalling and Mr. James Mackintosh, received their awards from the Minister of Agriculture, Sir Thomas Dugdale. They will hold the Baxter Trophy for six months each and in addition they were both presented with a gold medal and a cheque.

In presenting the commemorative medal and cheque to Sir Thomas Dalling the Minister said: "Sir Thomas Dalling has an international reputation in all matters of veterinary research and he is leaving the Ministry to undertake research on an international scale.

"We are sorry to lose him but I always think it is a very short-sighted policy if you have got someone very good to try to stop him going into wider fields. We shall miss him tremendously at the Ministry, but I am g'ad that he has taken the decision he has because I believe that in the years he has ahead of him he may be able to do much in solving problems in an international sphere so far as the health of livestock is concerned. He has been given this award because of what he has contributed to combating the diseases of dairy cattle, and we all know what the development of the S19 vaccine has done in revolutionising the position in regard to one of these diseases."

Sir Thomas Dalling, replying, said that he took the view that in honouring him they were honouring the whole veterinary profession and recognising that it had done something to improve animal health and the milk yield of the nation.

"It may be that before the war everyone was not fully alive to the activities which the veterinary profession was engaged in, but, at the onset of the war, when many veterinary surgeons were not required for active service work abroad, the veterinary profession in this country set itself out to see how it could assist in the increased production of foodstuffs which was demanded. I think that the members of our profession were able to assist the agricultural community in this effort.

"That assistance was received well and we were fully convinced that by advancing the health of the livestock population we could aid in world affairs. In my various world travels in recent years I have seen this more and more clearly. We will certainly continue our research work and our practical work in the field to help agriculture in so far as we possibly can.

"As the Minister has said, we have now come to the time when I have to leave this country and try to engage in operations in a wider fie'd, but I won't forget this country. We as a profession have a very big job to do not only here but throughout the world, and if one knows that the support of one's own countrymen is behind one it is half the battle.

"You can be sure that I do appreciate this award not only for myself but for the veterinary profession.

O.E.E.C. FOOD AND AGRICULTURE COMMITTEE'S ANIMAL DISEASES CONTROL PLAN

It will be recalled that the Organisation for European Economic Co-operation, through the medium of its Food and Agriculture Committee, set up a special working party of veterinarians to study the problem of animal disease in Europe, the Chairman of the Committee being Sir Thomas Dalling, Chief Veterinary Officer, Animal Health Division, Ministry of Agriculture.

In its recently issued report the working party recommends a vigorous campaign in all European countries for the control and ultimate eradication of bovine tuberculosis, brucellosis, bovine mastitis, foot-and-mouth disease and swine fever.

Bovine Tuberculosis.—Bovine tuberculosis should be controlled by the use of the tuberculin test and the disposal of reacting cattle. It is suggested that financial encouragement should be given to individual farmers and to groups of farmers to maintain herds free from tuberculosis, and that agricultural organisations should co-operate in eradication schemes. International standardisation of tuberculin is also recommended.

Brucellosis.—Control and final eradication should be carried out by suitable tests to detect infection with disposal of reactors, and by a vaccination scheme or by combining both.

Mastitis.—There should be control by the use of suitable antibiotics injected into the udder, together with the practice of good husbandry and dairy hygiene.

Foot-and-Mouth Disease.—Efforts should be made to eradicate the disease from all member countries. Control measures should include the slaughter of infected and in-contact animals, restriction of movement of livestock in infected areas and the use of potent vaccines according to circumstances.

Swine Fever.—Spread of the disease should be prevented by taking precautions against exposing pigs, directly or indirectly, to infected animals, pig meat and equipment. Boiling of all pig food of animal origin is strongly recommended. Preventive measures should include the use of swine fever crystal violet vaccine.

The major limiting factor in the development of an adequate programme for the control of disease has been the lack of sufficient financial assistance by governments to enable the necessary measures to be put into effect. The working party, therefore, strongly recommends that adequate funds be made available, with legislation where necessary, to implement its control programme.

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LEGAL NOTES

Warnings Ignored by Unregistered Man

Prosecuting for the Royal College of Veterinary Surgeons at Beaconsfield Magistrates' Court on February 26th, Mr. Maurice Ahern said that despite repeated warnings from the College, a Chalfont St. Peter man had for more than a year practised veterinary surgery while being unqualified to do so.

The man, James Wicks, aged 45, of Beacons Boarding Kennels, Joiners Lane, Chalfont St. Peter, was fined a total of £40 under the Veterinary Surgeons Act (1948), and was ordered to pay 10 guineas costs for practising veterinary surgery on a Welsh corgi dog on November 24th and November 26th last year while being unregistered.

During the hearing, the defending solicitor, Mr. G. L. Barnett, of Watford, changed Wicks's original plea of not guilty on each summons to one of guilty on each.

Mr. Ahern said that on November 24th, Mrs. O. M. Roberts, of "The Greyhound" public house, Chalfont St. Peter, telephoned Wicks and told him that her dog, a Welsh corgi, had swallowed a bone and was in pain. That evening Wicks had visited Mrs. Roberts and had administered some medicinal paraffin to the dog. Afterwards, Wicks had given Mrs. Roberts some M. and B. tablets to give the animal. Two days later, on November 26th, the condition of the dog had not improved, so Mrs. Roberts took it to the Beacons Boarding Kennels at Chalfont St. Peter where Wicks again examined it. After giving the dog an enema Wicks had said that there was nothing seriously wrong with it.

Mr. J. E. Garland, a veterinary surgeon, of London Road, Slough, said he examined the dog later the same day and found a piece of bone wedged in its gullet, which was causing the animal considerable pain. Realising there was little that could be done for the dog, he had put it to sleep.

Cross-examined by Mr. Barnett, Mr. Garland said that although it could have caused no harm, giving the dog an enema would have had no effect towards relieving its pain. He agreed, however, that medicinal paraffin might have helped to move the bone.

Submitting that there was no case to answer, Mr. Barnett said that Wicks had not administered veterinary surgery to the dog in the recognised sense, but had merely given it "first aid" in a case of emergency, which was not an offence. When told by the Chairman, Sir Norman Kendall, that the court would not accept this submission, Mr. Barnett changed Wicks's original plea of not guilty to each summons to one of guilty.

Upon hearing the change of plea, Mr. Ahern said, "This throws a different light on the case, and now I will give you a fuller picture of this man's history as a so-called veterinary surgeon. In July, 1950, the Royal College of Veterinary Surgeons had reason to believe that Wicks was practising veterinary surgery while unregistered to do so. They had written to him informing him that this was an offence and had asked him to sign an undertaking to say that he would not do so in the future. Wicks had ignored the letter, and two reminders from the College had received similar treatment. Wicks had applied later the same year to be placed on the supplementary list of veterinary surgeons, but his application had been refused on the grounds that he was unqualified to hold such a position. Now, a year later, we find Wicks still ignoring all these warnings and practising illegally. The College has a duty to protect animals. Animals have no say in who treats them, and they deserve protection."

Announcing a fine of £20 on each summons Sir Norman Kendall told Wicks "This is a very serious case in our view. You have simply refused to play according to the rules, after plain warning. That you were prepared to practise as a veterinary surgeon is quite obvious."

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ADDRESSES OF DISEASE-INFECTED PREMISES

The list given below indicates, first, the county in which are situated the premises on which disease has been confirmed, followed by the postal address and date of outbreak.

Anthrax:

Berks.—Marlston Farm, Hermitage, Newbury (Mar. 8th).
Buteshire.—Sannox Home Farm, Sannox, Isle of Arran (Mar. 7th).
Cornwall.—Lancare Farm, Pelynt, Looe (Mar. 12th).
Dunbarton.—Easter Cather Farm, Croftarnie, Gartocharn, Alexandria (Mar. 11th).
Lancs.—Park House Farm, Bay Horse, Lancaster; Yarrow Farm, German Lane, Charnock Richard, Chorley (Mar. 7th); Clifton Trees Farm, Salwick, Preston (Mar. 10th).
Yorks (W.R.).—Thimble Hall Farm, Cawthorne, Barnsley; Hunsworth Lodge Farm, Gomersal, Leeds (Mar. 10th).

Foot-and-Mouth Disease:

Essex.—Priestwood's Farm, Foulness, Southend-on-Sea (Mar. 16th).
Suffolk (E.).—Church Farm, Reydon, Southwold (Mar. 14th); Broad's Farm, Old Newton, Stowmarket (Mar. 17th); Nunnery Farm, Shipmeadow, Beccles (Mar. 15th); Hatherleigh Farm, Framlingham (Mar. 16th).
Sussex (E.).—Ringmer, Lewes (Mar. 18th).

Fowl Pest:

Herts.—The Ashes, Old Nazeing Road, Broxbourne (Mar. 12th).
Lancs.—Wood Lane Farm, Mawdesley, Ormskirk (Mar. 12th).
Lincs (Kesteven).—Sardson Farm, Kirkby-la-Thorpe, Sleaford (Mar. 9th).
Lincs (Lindsey).—Stow Park Farm, Stow, Lincoln (Mar. 7th).
Warwicks.—Fields Farm, Harbury, Leamington Spa; Westlands, Ratcliffe Culey, Atherstone (Mar. 8th); Glebe Farm, Tamworth-in-Arden, Birmingham (Mar. 13th).

Swine Fever:

Cambs.—The Mill, Chippenham, Nr. Ely (Mar. 14th).
Derbys.—Derwent House, Derwent Hospital, Derby (Mar. 10th).
Durham.—Lascelles Park, Darlington (Mar. 13th).
Herts.—Smith End, Barley, Nr. Royston (Mar. 14th).
Isle of Ely.—Camel Road, Littleport (Mar. 12th).
Kent.—Whinless Downs, Noah's Ark Road, Dover (Mar. 13th); Old Vauxhall Farm, Broad Oak Road, Canterbury (Mar. 15th).
Lancs.—New Hey Piggeries, Newton, Nr. Kirkham; Sandhole Cottage, Riley Green, Hoghton, Nr. Preston (Mar. 12th); Rockliffe Farm, Rochdale Road, Bacup; Cartford Bridge Farm, Little Eccleston (Mar. 13th).
Norfolk.—Church Farm, Necton, Swaffham (Mar. 11th).
Notts.—161, High Road, Chilwell (Mar. 10th).
Oxon.—Home Farm, Broughton, Banbury (Mar. 13th).
Salop.—Crowmere Farm, Monkmoor Road, Shrewsbury (Mar. 14th).
Staffs.—New House Farm, Drayton-Bassett (Mar. 10th).
Sussex (E.).—"Kiaora," Felcot Road, Furnace Wood, Felbridge (Mar. 10th); "Glyndar," Glynn Road, Peacehaven (Mar. 12th); Lottbridge Drove Piggeries, Eastbourne (Mar. 13th).
Warwicks.—Ivy House Farm, Wall Hill Road, Corley Moor, Coventry (Mar. 11th); Clapham Terrace Allotments, Leamington Spa (Mar. 15th).

SHEEP-WORRYING: CANINE DEFENCE LEAGUE'S ALTERNATIVES TO "REPRESSIVE LEGISLATION"

The National Canine Defence League, in a recent statement, express the view that repressive legislation will not help to secure the co-operation of dog owners, which is most necessary if the problem of sheep worrying by dogs is to be solved.

Of recent proposals for curbing the menace, the League comments that an increase in the licence fee for keeping a dog would be unlikely to have any effect. The League supports the proposal that dogs should be licensed immediately upon acquisition, regardless of age. This would overcome the tendency to acquire a puppy and then repudiate ownership when it becomes taxable, thereby creating a potential killer. To avoid penalising breeders, a special licence should be issued to cover any number of dogs they might own.

The League considers a proposed higher tax on bitches to be impracticable, and that earlier licensing of puppies would eliminate unwanted litters at birth. A proposed extension of the Dogs Act, 1906, to make statutory control of dogs possible during daylight is, in the opinion of the League, of doubtful value, and greater freedom to take action against stray dogs is strongly deprecated.

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HARD PAD AMONG LAKE DISTRICT HOUNDS

The Cockermouth Correspondent of *The Times*, in a message dated March 17th, states that hard pad has broken out in the Lake District "at a time when continuance of mountain foxhunting is vital for the hill farming industry, dependent on a successful lambing season." The malady has attacked the Eskdale and Ennerdale footpack. "Up to to-night three hounds have died, and 10 others are affected by the complaint. Even when hounds survive, they are listless, disinterested, and of little use for several months."

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Correction of Reference.—"An outbreak of ulcerative lymphangitis in young heifers in Kenya," R. M. S. Neave, *Vet. Rec.* **63**, 185, the second reference should read: Bruner, D. W., Dimock, W. W., & Edwards, P. R. (1939.) *J. Infect. Dis.* **65**, 92-96.

CORRESPONDENCE

The views expressed in letters addressed to the Editor represent the personal opinions of the writer only and their publication does not imply endorsement by the B.V.A.

PARTIAL DILATATION OF THE *OS UTERI* IN THE EWE

Sir,— With reference to the use of stilboestrol dipropionate in the treatment of partial dilatation of the *os uteri* in ewes, as mentioned by Messrs. Yarrow and Williams in *The Veterinary Record* of March 15th, No. 11. Vol. 64, I also have had considerable success in its use, but giving only 20 mg. intramuscularly and repeating at 24 hours if necessary. It will not dilate vulva and vagina, however, should they be constricted.

Ewes thus treated can be bred from the following year and may lamb quite normally: it has been my experience that the condition is commonest at first parturition.

An interesting point would be the breed incidence of this condition as I have never seen it in any of the downland breeds.—Yours faithfully, F. V. Edwards, Bay Tree Cottage, Chillington, Kingsbridge, South Devon. *March 14th*, 1952.

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THE R.C.V.S. COUNCIL ELECTION

Sir,—I would like to comment on Mr. Anderson's letter on the above subject. Firstly, the circular to which he takes exception was sent to all veterinary surgeons whose names appear in the current list of members. If, as Mr. Anderson says, he resigned from the Society some time ago, the information was not conveyed to me when I assumed the duties of Hon. Secretary.

I would also point out that when the decision to take action on the matter of the disproportion of practising veterinary surgeons on Council R.C.V.S. was adopted, it was not known who would be standing as candidates for the current election.

Speaking personally, and I am confident I am also expressing the views of the Society, it was very gratifying to note when the list of candidates was received, that the names of so many distinguished and well-known practising veterinary surgeons appeared. This might not have been the case, however, and may not be in future elections, hence the decision to have at least two members in practice to support.

Lest Mr. Anderson's observations on "touting for support," and doing as "his union tells him" give a wrong impression to those in the profession who did not receive the circular, permit me to quote the actual words used, *i.e.*, "members of this Society are invited therefore to give these two gentlemen their vote."

It ought to be within Mr. Anderson's knowledge that other branches of the B.V.A. support particular candidates as, I submit, they have a perfect right to do.

In conclusion it is gratifying to know that Mr. Anderson, like so many other practising veterinary surgeons, feels "it is vitally important that its practising members should take an active and leading part in the work of the Royal College and other organised bodies within the profession." Had that feeling existed more strongly a few years ago it is more than probable this Society should not have felt impelled to change its name from "The Society of Veterinary Practitioners."—Yours faithfully, J. J. Dunlop, *Hon. Secretary*, Society of Practising Veterinary Surgeons, 2, Basil Mansions, London, S.W.3.

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14th INTERNATIONAL VETERINARY CONGRESS, LONDON

Sir,—I note in to-day's issue of *The Veterinary Record* that our Swedish friends have already put out a preliminary programme for the 15th International Veterinary Congress to be held in Stockholm next year.

This prompts me to enquire what has happened to the proceedings of the previous Congress held as long ago as 1949 in London. Apart from loose printings of papers which were handed out on joining the Congress, we have received no properly bound proceedings of this Congress at all.

In 1949, I had to cut short my visit to the International Veterinary Congress in London to attend the International Dairy Congress in Stockholm. The contrast in organisation as far as publication of proceedings was concerned was most marked. On arrival at the Stockholm Dairy Congress, each member was immediately presented with four *bound* copies of the proceedings, and early this year I received a bound copy of the discussions of those papers.

Can anyone tell us if we are ever likely to receive the proceedings of the 14th International Congress in a suitably permanent form?—Yours faithfully, D. L. Hughes, Hill Farm House, Thurgarton, Notts. *March 15th*, 1952.

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ANAESTHESIA OF THE BOVINE TEAT

Sir,—I suggest that Planocaine has been superseded by Anethaine (Glaxo) or Willothaine (Willows) for all anaesthesia of the bovine teat.

These surface anaesthetics can be applied either to the outside of the teat, *e.g.*, suturing wounds for Maclean's operation, or infused into the teat canal by means of a teat syphon for surgical interference with Hudson's teat instruments. They give excellent anaesthesia with the minimum of trouble.—Yours faithfully, John C. Hartley, 8, Monks Road, Lincoln. *March 14th*, 1952.

DISEASES OF ANIMALS ACT, 1950—GREAT BRITAIN

Summary of Returns of Confirmed Outbreaks of Scheduled (Notifiable) Diseases

Period	Anthrax	Foot-and-mouth	Fowl Pest	Parasitic Mange*	Sheep Scab	Swine Fever
16th to 29th Feb., 1952	12	4	6	—	1	48
Corresponding period in—						
1951	24	—	46	—	—	27
1950	22	2	1	—	2	—
1949	4	4	15	—	3	1
1st Jan. to 29th Feb., 1952	74	26	45	—	1	162
Corresponding period in—						
1951	105	15	414	—	4	151
1950	78	6	28	—	15	—
1949	28	5	87	—	13	4

* Excluding outbreaks in Army Horses.

Tuberculosis (Attested Herds) Scheme

The number of Attested Herds, *i.e.*, herds officially certified as free from Tuberculosis as at February 29th, 1952, was as follows:—

England	Wales	Scotland	Total (Great Britain)
37,901	21,623	17,896	77,420